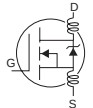


Electrical Characteristics @ $T_J = 25^\circ\text{C}$ (unless otherwise specified)

	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	20	—	—	V	$V_{GS} = 0V, I_D = 250\mu A$
$\Delta V_{(BR)DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	—	0.019	—	V/ $^\circ\text{C}$	Reference to 25°C , $I_D = 1mA$
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	—	—	0.008	Ω	$V_{GS} = 4.5V, I_D = 64A$ ④
		—	—	0.007		$V_{GS} = 7.0V, I_D = 64A$ ④
$V_{GS(th)}$	Gate Threshold Voltage	0.70	—	—	V	$V_{DS} = V_{GS}, I_D = 250\mu A$
g_{fs}	Forward Transconductance	77	—	—	S	$V_{DS} = 10V, I_D = 64A$
I_{DSS}	Drain-to-Source Leakage Current	—	—	25	μA	$V_{DS} = 20V, V_{GS} = 0V$
		—	—	250		$V_{DS} = 10V, V_{GS} = 0V, T_J = 150^\circ\text{C}$
I_{GSS}	Gate-to-Source Forward Leakage	—	—	100	nA	$V_{GS} = -10V$
	Gate-to-Source Reverse Leakage	—	—	-100		$V_{GS} = 10V$
Q_g	Total Gate Charge	—	—	110	nC	$I_D = 64A$
Q_{gs}	Gate-to-Source Charge	—	—	27		$V_{DS} = 16V$
Q_{gd}	Gate-to-Drain ("Miller") Charge	—	—	39		$V_{GS} = 4.5V$, See Fig. 6 ④
$t_{d(on)}$	Turn-On Delay Time	—	10	—	ns	$V_{DD} = 10V$
t_r	Rise Time	—	140	—		$I_D = 64A$
$t_{d(off)}$	Turn-Off Delay Time	—	96	—		$R_G = 3.8\Omega, V_{GS} = 4.5V$
t_f	Fall Time	—	130	—		$R_D = 0.15\Omega$, ④
L_D	Internal Drain Inductance	—	4.5	—	nH	Between lead, 6mm (0.25in.)
L_S	Internal Source Inductance	—	7.5	—		from package and center of die contact
C_{iss}	Input Capacitance	—	4700	—	pF	$V_{GS} = 0V$
C_{oss}	Output Capacitance	—	1900	—		$V_{DS} = 15V$
C_{rss}	Reverse Transfer Capacitance	—	640	—		$f = 1.0MHz$, See Fig. 5



Source-Drain Ratings and Characteristics

	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	—	—	110	A	MOSFET symbol showing the integral reverse p-n junction diode.
I_{SM}	Pulsed Source Current (Body Diode) ①	—	—	420		
V_{SD}	Diode Forward Voltage	—	—	1.3	V	$T_J = 25^\circ\text{C}, I_S = 64A, V_{GS} = 0V$ ④
t_{rr}	Reverse Recovery Time	—	87	130	ns	$T_J = 25^\circ\text{C}, I_F = 64A$
Q_{rr}	Reverse Recovery Charge	—	200	310	nC	$di/dt = 100A/\mu s$ ④
t_{on}	Forward Turn-On Time	Intrinsic turn-on time is negligible (turn-on is dominated by $L_S + L_D$)				

Notes:

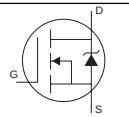
① Repetitive rating; pulse width limited by max. junction temperature.

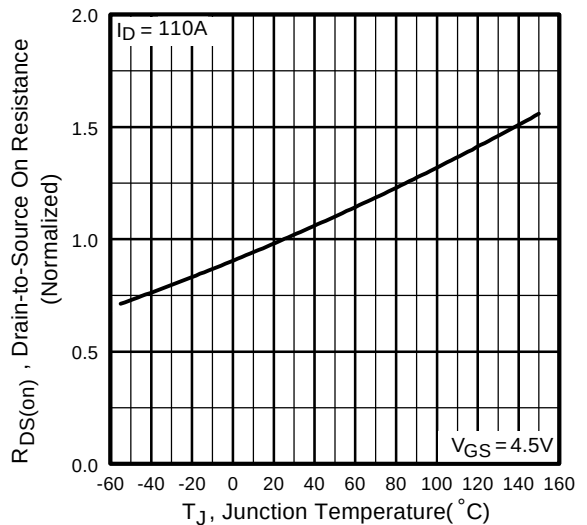
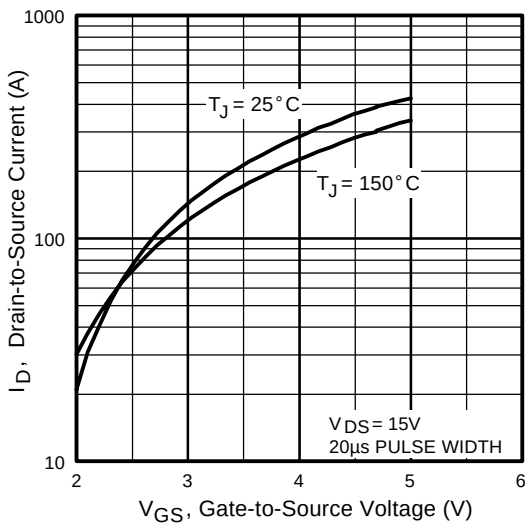
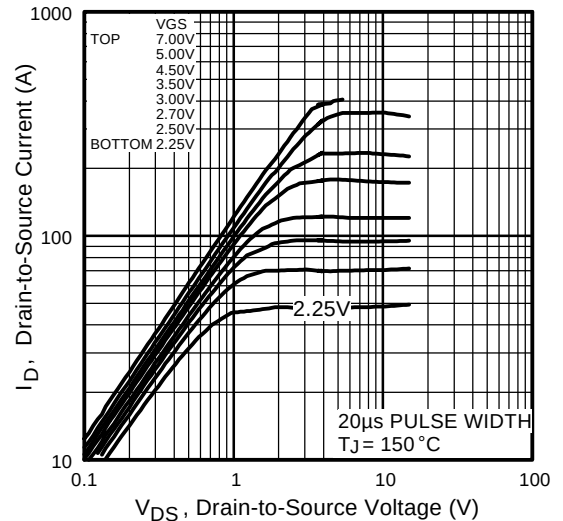
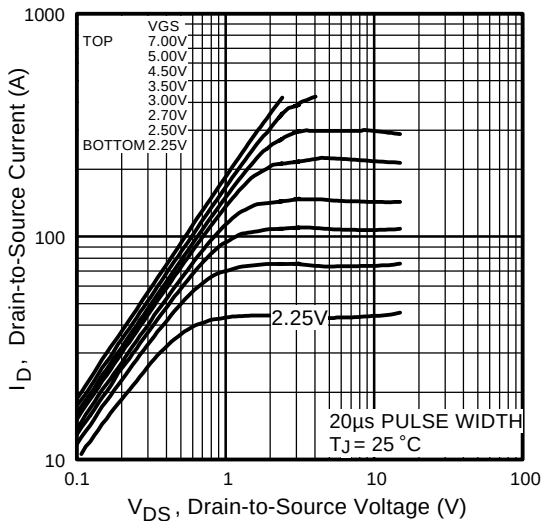
② Starting $T_J = 25^\circ\text{C}$, $L = 190\mu H$
 $R_G = 25\Omega$, $I_{AS} = 64A$.

③ $I_{SD} \leq 64A$, $di/dt \leq 86A/\mu s$, $V_{DD} \leq V_{(BR)DSS}$,
 $T_J \leq 150^\circ\text{C}$

④ Pulse width $\leq 300\mu s$; duty cycle $\leq 2\%$.

⑤ Calculated continuous current based on maximum allowable junction temperature; for recommended current-handling of the package refer to Design Tip # 93-4





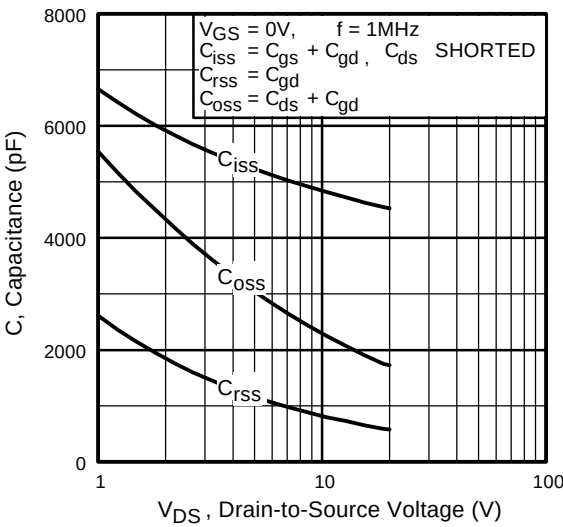


Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage

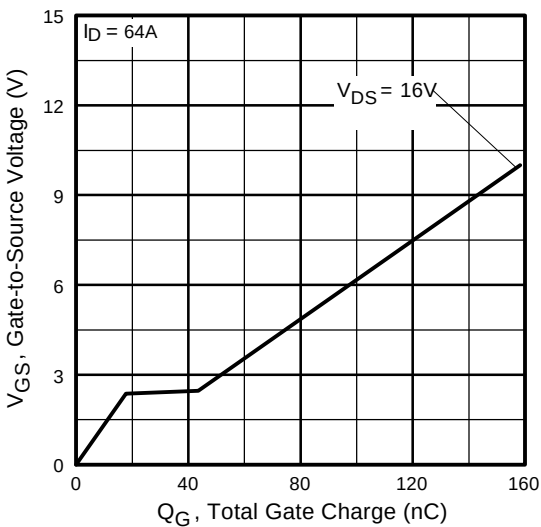


Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage

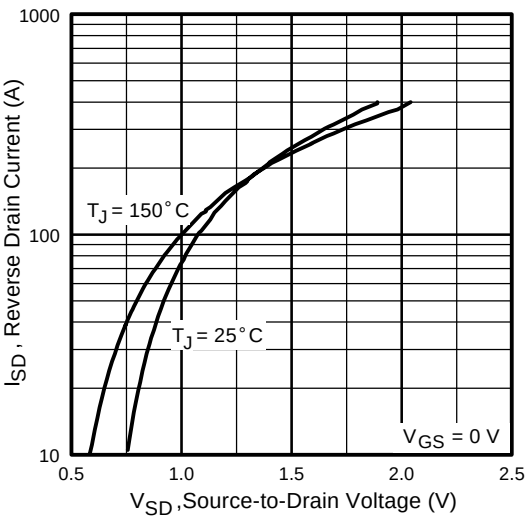


Fig 7. Typical Source-Drain Diode Forward Voltage

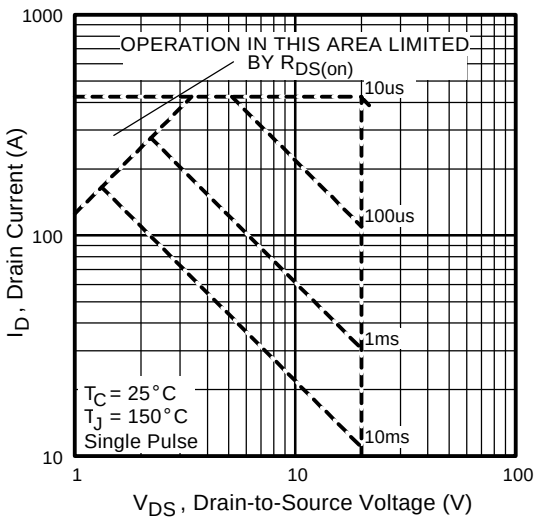


Fig 8. Maximum Safe Operating Area

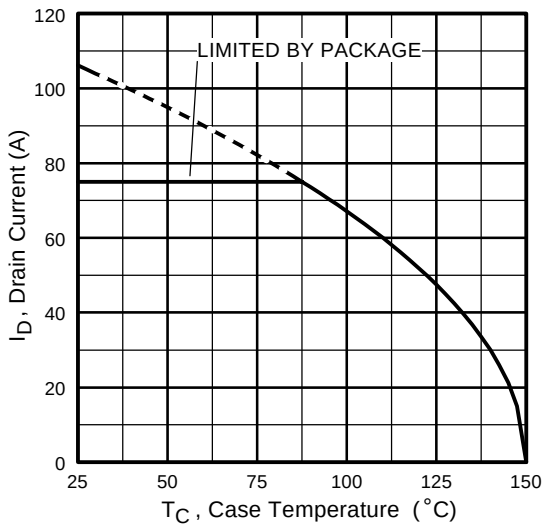


Fig 9. Maximum Drain Current Vs. Case Temperature

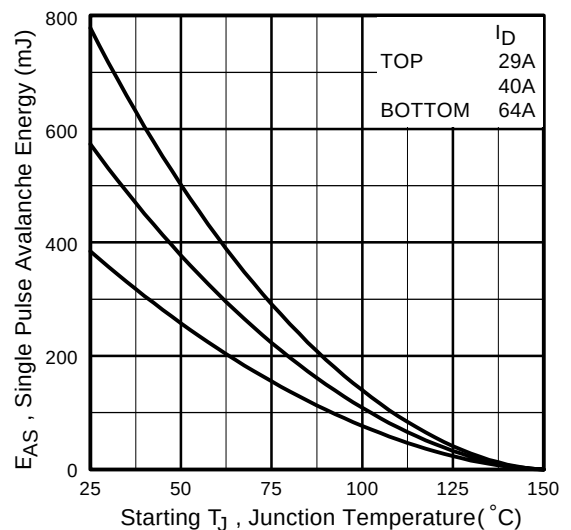


Fig 10. Maximum Avalanche Energy Vs. Drain Current

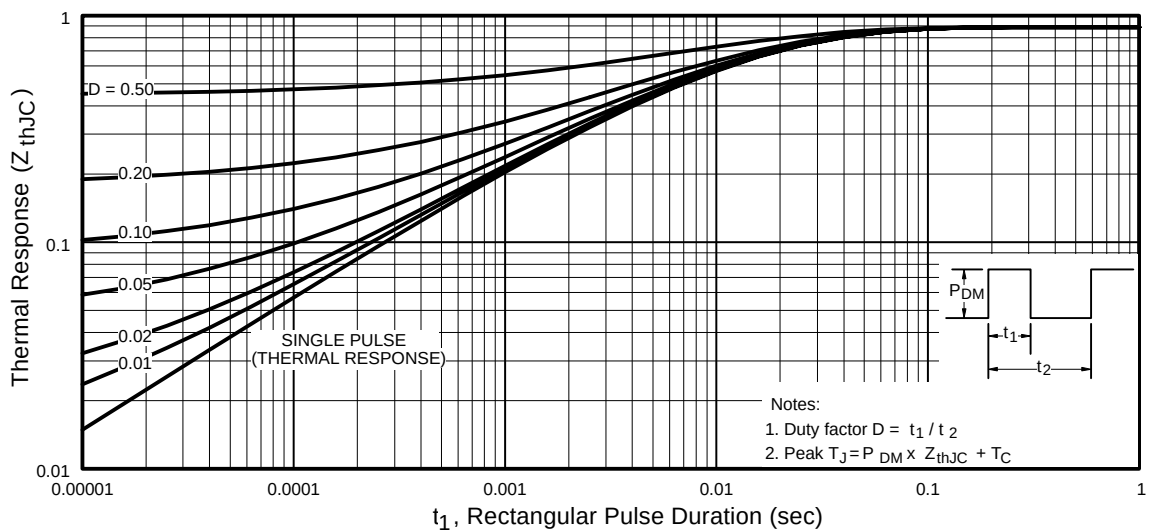


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Case

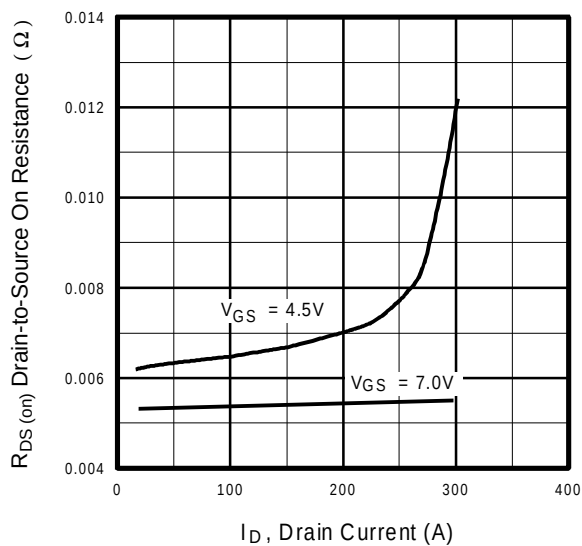


Fig 12. On-Resistance Vs. Drain Current

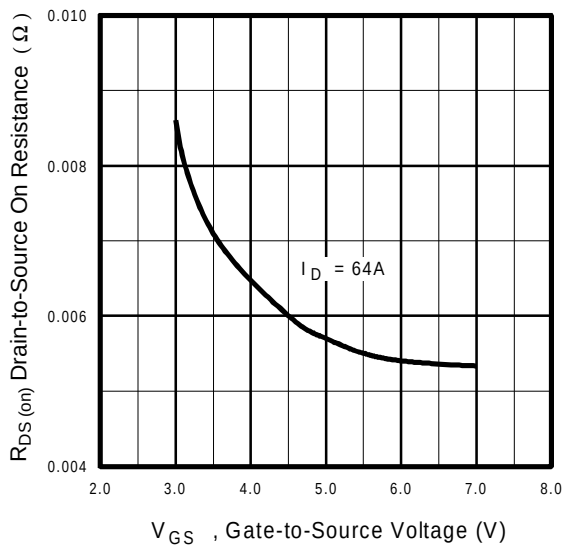
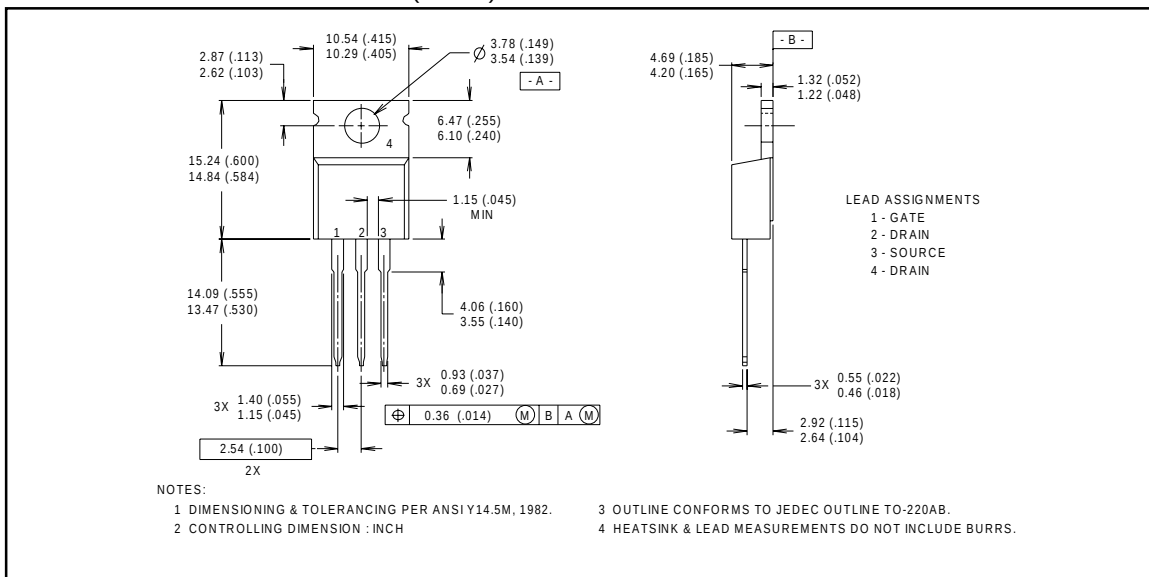


Fig 13. On-Resistance Vs. Gate Voltage

Package Outline

TO-220AB Outline

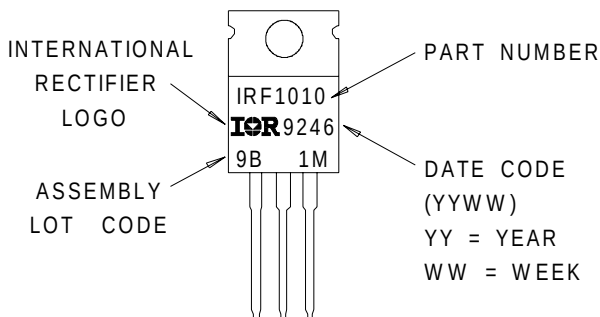
Dimensions are shown in millimeters (inches)



Part Marking Information

TO-220AB

EXAMPLE : THIS IS AN IRF1010
WITH ASSEMBLY
LOT CODE 9B1M



International
IR Rectifier

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IR CANADA: 7321 Victoria Park Ave., Suite 201, Markham, Ontario L3R 2Z8, Tel: (905) 475 1897

IR GERMANY: Saalburgstrasse 157, 61350 Bad Homburg Tel: ++ 49 6172 96590

IR ITALY: Via Liguria 49, 10071 Borgaro, Torino Tel: ++ 39 11 451 0111

IR FAR EAST: K&H Bldg., 2F, 30-4 Nishi-Ikebukuro 3-Chome, Toshima-Ku, Tokyo Japan 171 Tel: 81 3 3983 0086

IR SOUTHEAST ASIA: 315 Outram Road, #10-02 Tan Boon Liat Building, Singapore 0316 Tel: 65 221 8371

<http://www.irf.com/> Data and specifications subject to change without notice.

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